

### **REMARKS**

In this Response, Applicants amend claims 8, 15, 20, 26, 33, 40, and 45. No new matter has been added.

Claims 8-12, 15-18, 20, 22, 26-30, 33-37, 40-43, 45, 47, 52-67, and 77-87 are currently pending, of which claims 8, 15, 20, 26, 33, 40, and 45 are independent. Applicants respectfully submit that all of the pending claims are in condition for allowance.

#### **I. Summary of Rejections**

Claims 8-12, 15-18, 20, 22, 26-30, 33-37, 40-43, 45, 47, 52-67, and 77-87 are rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter (Office Action, page 2).

Claims 8-12, 15-18, 20, 22, 26-30, 33-37, 40-43, 45, 47, 52-67, and 77-87 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement (Office Action, page 8).

Claims 8-12, 15-18, 20, 22, 26-30, 33-37, 40-43, 45, 47, 52-67, and 77-87 are rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 03/001891 to Kelly *et al.* (hereafter “Kelly”) (Office Action, page 9).

These rejections will be discussed separately below.

#### **II. Claim Rejection under 35 U.S.C. § 101**

Claims 8-12, 15-18, 20, 22, 26-30, 33-37, 40-43, 45, 47, 52-67, and 77-87 are rejected under 35 U.S.C. § 101 as being drawn to non-statutory subject matter (Office Action, page 2).

With regard to amended independent claims 8, 20, 33, and 45, Applicants respectfully note the applicable test for patent-eligible subject matter is the machine-or-transformation test set forth in *In re Bilski*. *In re Bilski*, 545 F.3d 943, 88 U.S.P.Q.2d 1385. Under the machine-or-

transformation test, a method claim is patentable subject matter if (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.

Amended independent claims 8, 20, 33, and 45 recite methods including steps that are performed by **a computer**. Support for the claim amendments can be found at least at Figure 2A and 2B and related text. Hence, claims 8, 20, 33, and 45 are not directed to merely abstract methods; rather claims 8, 20, 33, and 45 recite concrete devices. As such, claims 8, 20, 33, and 45 satisfy the **machine prong** of the machine-or-transformation test, because the methods of claims 8, 20, 33, and 45 include steps performed using a computer, which is a particular machine.

Amended claims 8 and 33 recite simulating a constructed model to **transform a first set of data into a second set of data representing a second state of one or more chemical substances**. Similarly, amended claims 20 and 45 recite analyzing a simulation of a constructed model to **generate a second set of data representing a second state of one or more chemical substances**. Hence, claims 8, 20, 33, and 45 transform data representing chemical substances, which are actual physical chemicals. As such, claims 8, 20, 33, and 45 also satisfy the **transformation prong** of the machine-or-transformation test, because the methods of claims 8, 20, 33, and 45 recite transformation of data representing actual chemical substances.

With regard to amended independent claims 15 and 40, these claims recite **a computer-readable medium storing computer-executable instructions**. Support for the claim amendments can be found at least at page 42 of the specification. Applicants respectfully note that claims 15 and 40 are Beauregard claims, which are claims in which a tangible computer storage media is claimed containing software programming steps. Beauregard claims are considered statutory subject matter, and the machine-or-transformation test set forth in *In re Bilski* need not be applied to assess the patentability of Beauregard claims. *Ex parte Bo Li*, Appeal 2008-1213, Application No. 10/463287.

With regard to amended independent claim 26, this claim recites a **computer-implemented system** including **a processor**. Support for the claim amendments can be found at least at Figure 2A and 2B and related text. Hence, claim 26 recites concrete devices.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 101 rejection of claims 8-12, 15-18, 20, 22, 26-30, 33-37, 40-43, 45, 47, 52-67, and 77-87.

### **III. Claim Rejection under 35 U.S.C. § 112, First Paragraph**

Claims 8-12, 15-18, 20, 22, 26-30, 33-37, 40-43, 45, 47, 52-67, and 77-87 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement (Office Action, page 8). More specifically, the Examiner asserts that the recitation of “a first set of data representing a first state of a plurality of chemical substances and the first set of data is transformed to a second set representing a second state of the plurality of chemical substances in the modeled process” in claims 8 and 20 are not adequately described in the application (Office Action, page 8). Applicants respectfully draw the Examiner’s attention to pages 25-30 of the specification which describe the transformation of states in a modeled process.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 101 rejection of claims 8-12, 15-18, 20, 22, 26-30, 33-37, 40-43, 45, 47, 52-67, and 77-87.

### **IV. Claim Rejection under 35 U.S.C. § 103(a)**

Claims 8-12, 15-18, 20, 22, 26-30, 33-37, 40-43, 45, 47, 52-67 and 77-87 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kelly (Office Action, page 9). Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 8-12, 15-18, 20, 22, 26-30, 33-37, 40-43, 45, 47, 52-67 and 77-87 as set forth below.

#### **A. Claim 8**

Independent claim 8 recites:

“A computer-implemented method for integrated modeling and simulation of a biological process comprising a plurality of chemical substances, the method comprising:

(a) constructing, using a computer, a model of the biological process, *the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, the textual user interface allowing a user to create a script that automatically edits the constructed model*, the constructed model including a first set of data that represents a first state of the plurality of chemical substances;

(b) simulating, using the computer, the constructed model of the biological process to transform the first set of data into a second set of data representing a second state of the plurality of chemical substances in the modeled biological process during a simulation of the biological process; and

(c) automatically refining, using the computer, the constructed model based on the simulation.” [emphasis added]

Applicants respectfully submit that Kelly fails to disclose or suggest at least the following feature of independent claim 8: “the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, the textual user interface allowing a user to create a script that automatically edits the constructed model.” Support for this feature of claim 33 can be found at least at page 16, lines 13-14 of the specification.

Kelly does not disclose or suggest that the model is modified by user commands received through a textual user interface, as required by claim 8. Furthermore, Kelly does not disclose or suggest a textual user interface that allows a user to create a script that automatically edits the model, as required by claim 8.

As such, Applicants respectfully submit that Kelly does not disclose or suggest “the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, the textual user interface allowing a user to create a script that automatically edits the constructed model,” as recited in claim 8.

For at least the reasons set forth above, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claim 8. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claim 8.

**B. Claims 9-12 and 52-63**

Claims 9-12 and 52-63 depend from independent claim 8 and, as such, incorporate all of the features of claim 8. For at least the reasons set forth above in connection with claim 8, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claims 9-12 and 52-63. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claims 9-12 and 52-63.

**C. Claim 15**

Independent claim 15 recites:

“A computer-readable medium storing computer-executable instructions for integrated modeling and simulation of a biological process, the medium storing one or more instructions for:

(a) constructing a model of the biological process, wherein *the constructed model is modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, the textual user interface allowing a user to create a script that automatically edits the constructed model;*

(b) generating, using the constructed model of the biological process, an expected output of the modeled biological process during the simulation of the biological process; and

(c) automatically refining the constructed model based on the expected output.” [emphasis added]

Applicants respectfully submit that Kelly fails to disclose or suggest at least the following feature of independent claim 15: “the constructed model is modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, the textual user interface allowing a user to create a script that automatically edits the constructed model.” Support for this feature of claim 33 can be found at least at page 16, lines 13-14 of the specification.

As noted above in connection with claim 8, Kelly does not disclose or suggest that the model is modified by user commands received through **a textual user interface**, as required by claim 15. Furthermore, Kelly does not disclose or suggest a textual user interface that allows a user to create **a script that automatically edits the model**, as required by claim 15.

For at least the reasons set forth above, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claim 15. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claim 15.

#### **D. Claims 16-18**

Claims 16-18 depend from independent claim 15 and, as such, incorporate all of the features of claim 15. For at least the reasons set forth above in connection with claim 15, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claims 16-18. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claims 16-18.

#### **E. Claim 20**

Independent claim 20 recites:

“A computer-implemented method for integrated modeling and simulation of a biological process comprising a plurality of chemical substances, the method comprising:

(a) constructing, using a computer, a model of a biochemical process in a modeling component, the constructed model including a first set of data that represents a first state of the plurality of chemical substances, *the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, wherein the textual user interface automatically prompts a second user input in response to a first user input received through the graphical user interface*;

(b) analyzing, using the computer, a simulation of the constructed model of the biological process to generate a second set of data representing a second state of the plurality of chemical substances in the modeled biological process; and

(c) transmitting, using the computer, the second set of data to the modeling component, wherein the constructed model is automatically

refined based on the simulation of the constructed model of the biological process.” [emphasis added]

Applicants respectfully submit that Kelly fails to disclose or suggest at least the following feature of independent claim 20: “the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, wherein the textual user interface automatically prompts a second user input in response to a first user input received through the graphical user interface.” Support for this feature of claim 20 can be found at least at page 16, lines 10-12 of the specification.

Kelly discusses that an adaptive immune response model can be constructed and analyzed using a computer system. Kelly also discusses that the computer system includes a video display unit 108 on which a user interface can be displayed (Kelly, pages 12 and 13).

However, Kelly does not disclose or suggest that the model is modified by user commands received through **a textual user interface**, as required by claim 20. Furthermore, Kelly does not disclose or suggest a textual user interface that **automatically prompts a second user input** in response to a first user input received through a graphical user interface, as required by claim 20.

As such, Applicants respectfully submit that Kelly does not disclose or suggest “the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, wherein the textual user interface automatically prompts a second user input in response to a first user input received through the graphical user interface,” as recited in claim 20.

For at least the reasons set forth above, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claim 20. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claim 20.

**F. Claim 22**

Claim 22 depends from independent claim 20 and, as such, incorporates all of the features of claim 20. For at least the reasons set forth above in connection with claim 20, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claim 22. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claim 22.

**G. Claim 26**

Independent claim 26 recites:

“A computer-implemented system for integrated modeling and simulation of a chemical reaction comprising:

a processor configured to process:

a modeling component for constructing a model of a chemical substance, the constructed model including a first set of data that represents a first state of the chemical substance, *the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, wherein the textual user interface automatically prompts a second user input in response to a first user input received through the graphical user interface*; and

a simulation engine in communication with the modeling component, the simulation engine accepting as input the constructed model of the chemical substance and transforming the first set of data into a second set of data representing a second state of the chemical substance, the constructed model being automatically refined based on the first and second sets of data.”  
[emphasis added]

Applicants respectfully submit that Kelly fails to disclose or suggest at least the following feature of independent claim 26: “the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, wherein the textual user interface automatically prompts a second user input in response to a first user input received through the graphical user interface.” Support for this feature of claim 20 can be found at least at page 16, lines 10-12 of the specification.



As noted above in connection with claim 20, Kelly does not disclose or suggest a textual user interface that automatically prompts a second user input in response to a first user input received through a graphical user interface, as required by claim 26.

For at least the reasons set forth above, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claim 26. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claim 26.

#### **H. Claims 27-30 and 64-67**

Claims 27-30 and 64-67 depend from independent claim 26 and, as such, incorporate all of the features of claim 26. For at least the reasons set forth above in connection with claim 26, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claims 27-30 and 64-67. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claims 27-30 and 64-67.

#### **I. Claim 33**

Independent claim 33 recites:

“A computer-implemented method for integrated modeling and simulation of chemical reactions, the method comprising:

(a) constructing, using a computer, a model of a chemical substance, the constructed model including a first set of data that represents a first state of the chemical substance, *the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, the textual user interface allowing a user to create a script that automatically edits the constructed model;*

(b) simulating, using the computer, the constructed model of the chemical substance to transform the first set of data into a second set of data representing a second state of the chemical substance; and

(c) automatically refining, using the computer, the constructed model based on the simulation.” [emphasis added]

Applicants respectfully submit that Kelly fails to disclose or suggest at least the following feature of independent claim 33: “the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is

separate from the graphical user interface, the textual user interface allowing a user to create a script that automatically edits the constructed model.” Support for this feature of claim 33 can be found at least at page 16, lines 13-14 of the specification.

Kelly does not disclose or suggest that the model is modified by user commands received through **a textual user interface**, as required by claim 33. Furthermore, Kelly does not disclose or suggest a textual user interface that allows a user to create **a script that automatically edits the model**, as required by claim 33.

As such, Applicants respectfully submit that Kelly does not disclose or suggest “the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, the textual user interface allowing a user to create a script that automatically edits the constructed model,” as recited in claim 33.

For at least the reasons set forth above, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claim 33. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claim 33.

**J. Claims 34-37**

Claims 34-37 depend from independent claim 33 and, as such, incorporate all of the features of claim 33. For at least the reasons set forth above in connection with claim 33, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claims 34-37. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claims 34-37.

**K. Claim 40**

Independent claim 40 recites:

“A computer-readable medium storing computer-executable instructions for integrated modeling of chemical reactions, the medium comprising instructions for:

constructing a model of a chemical reaction, wherein *the constructed model is modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, the textual user interface allowing a user to create a script that automatically edits the constructed model;*  
generating, using the constructed model of the chemical reaction, an expected output of the modeled chemical reaction; and  
automatically refining the constructed model based on the expected output.” [emphasis added]

Applicants respectfully submit that Kelly fails to disclose or suggest at least the following feature of independent claim 40: “the constructed model is modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, the textual user interface allowing a user to create a script that automatically edits the constructed model.” Support for this feature of claim 40 can be found at least at page 16, lines 13-14 of the specification.

As noted above in connection with claim 33, Kelly does not disclose or suggest a textual user interface that allows a user to create a script that automatically edits the model, as required by claim 40.

For at least the reasons set forth above, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claim 40. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claim 40.

**L. Claims 41-43 and 77-87**

Claims 41-43 and 77-87 depend from independent claim 40 and, as such, incorporate all of the features of claim 40. For at least the reasons set forth above in connection with claim 40, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claims 41-43 and 77-87. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claims 41-43 and 77-87.

**M. Claim 45**

Independent claim 45 recites:

“A computer-implemented method for integrated modeling of chemical reactions, the method comprising:

(a) constructing, using a computer, a model of a chemical substance, the constructed model including a first set of data that represents a first state of the chemical substance, *the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, the graphical user interface allowing a user to create a script that automatically edits the constructed model;*

(b) analyzing, using the computer, simulation of the constructed model of the chemical substance to generate a second set of data representing a second state of the chemical substance; and

(c) transmitting, using the computer, the second set of data to the modeling environment, wherein the constructed model is automatically refined based on the simulation of the constructed model of the chemical substance.” [emphasis added]

Applicants respectfully submit that Kelly fails to disclose or suggest at least the following feature of independent claim 45: “the constructed model being modified by user commands received through both a graphical user interface and a textual user interface that is separate from the graphical user interface, the graphical user interface allowing a user to create a script that automatically edits the constructed model.” Support for this feature of claim 45 can be found at least at page 16, lines 13-14 of the specification.

As noted above in connection with claim 33, Kelly does not disclose or suggest a textual user interface that allows a user to create a script that automatically edits the model, as required by claim 45.

For at least the reasons set forth above, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of claim 45. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claim 45.

#### **N. Claim 47**

Claim 47 depends from independent claim 45 and, as such, incorporates all of the features of claim 45. For at least the reasons set forth above in connection with claim 45, Applicants respectfully submit that Kelly fails to disclose or suggest each and every feature of

claim 47. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claim 47.

**CONCLUSION**

In view of the above remarks, Applicants believe that the pending application is in condition for allowance and urges the Examiner to pass the claims to allowance. Should the Examiner feel that a teleconference would expedite the prosecution of this application, the Examiner is urged to contact the Applicants' attorney at (617) 227-7400.

Please charge any shortage or credit any overpayment of fees to our Deposit Account No. 12-0080, under Order No. MWS-108RCE2. In the event that a petition for an extension of time is required to be submitted herewith, and the requisite petition does not accompany this response, the undersigned hereby petitions under 37 C.F.R. § 1.136(a) for an extension of time for as many months as are required to render this submission timely. Any fee due is authorized to be charged to the aforementioned Deposit Account.

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Respectfully submitted,

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